sciendo Organization, Technology and Management in Construction 2019; 11: 1925–1932

Research Article Open Access

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Market value of the view restriction

DOI 10.2478/otmcj-2019-0002
Received October 4, 2018; accepted February 8, 2019

Abstract: Based on the international literature, the effect of an existing panoramic view on the market value of properties is positive and significant. This value-adding factor varies by location and by type of view. In Central Europe, no such evaluation study has been elaborated until now. New building construction may restrict the existing panorama, and this is the other side of the same phenomenon. View restriction may result in stigmatization, which is a negative effect on the property. There are two major methodologies to observe the effect: revealed preference method (RPM) and stated preference method (SPM). One SPM approach is contingent valuation (CV), wherein well-informed stakeholders give their opinion about the impact caused by the investigated effect. The CV methodology, using the Delphi approach, was employed to observe the market value decrease in the cases of several restricted panorama situations in Budapest. Based on the research, this effect in Budapest is in line with the published western results. The result of the study can be used to support real estate developers and architects in their development decisions. This is an extended version of the article titled "The impact of view-restriction: a Delphi case study from Budapest", presented at Creative Construction Conference 2018, CCC 2017, 30 June to 3 July 2018, Ljubljana, Slovenia.

Keywords: market value, panorama, view restriction, stigmatized property, Delphi method

1 Introduction

In the international literature, the value-changing effect of a panorama in real estate has been studied extensively and in many different ways. Various studies have provided estimates for the added value of panoramas with significant standard deviation (Bourassa et al. 2004). However, in certain regions and cases, experts' findings converge more and more. We may conclude that a strong professional consensus has emerged regarding individual environments and panorama types. It should also be noted that the literature agrees that the existence of a panorama in the case of a residential property is a significant value-increasing factor (Chau et al. 2002). However, to the best of the author's knowledge, the studies carried out so far have not yet covered the Central European region.

The virtual counterpart of the panorama's value-increasing effect is the reduction in value that results from the restriction of the view. We assume that the increase in value caused by the existence of a panorama and the decrease in value that results from its restriction show a close correlation. The effect of view restriction can be studied and quantified based on the effect of the existence of a panorama and vice versa: the decrease in value resulting from a construction in front of the building can provide an estimate for the value of a panorama.

The possibility or factuality of view restriction is a sort of encumbrance on a real property. The definition of stigmatized real estate is the following: "Stigmatised real estate is a property that is marked by an external negative impact. The external influence may reduce the value of the real estate through a specific multilayer filter" (Hajnal 2017a). Given that the value of a view is generated as described in the definition, i. e. through a multilayer social, cultural and communication filter on individual real estate markets, such events of view restriction fall within the scope of stigmatized real property.

In the literature, the methods typically used for estimating decreases in the value of stigmatized real property can be divided into two groups: revealed preference method (RPM) and stated preference method (SPM). The majority of international studies follow RPM, applying one of its frequently used analytical methods, the generation of a hedonic model. However, in data-poor areas, several authors use SPM, particularly one of its branches, the contingent valuation (CV) method.

That said, the hypothesis in this article is that the extent of the decrease in value that results from view

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restriction regarding residential properties situated in Budapest follows the trends that determine the value of panorama, which were described in the literature. To examine the hypothesis, we used the Delphi method, which is part of the CV methodology.

Following these introductory thoughts, the article presents the research in the following structure: first, it provides a review on the findings of the literature, then it describes the methodology and implementation of the examination, and finally, it ends with the analysis of the results and the conclusions.

2 Literature review

The literature already discussed the value-increasing effect of a view back in the early 1900s (Isenstadt 1999). The first hedonic analysis that has provided an actual value was published by Brown in 1977, when he studied the value-increasing effect of waterfronts (Brown and Pollakowski 1977). He made the important conclusion that the value of a real property decreases as the distance from the waterfront increases; three-quarters of the value increase caused by a waterfront location is already lost 100 m (300 ft) away from the waterfront. In 1994, Rodriguez and Sirmans studied the market for detached houses in Virginia (USA), and concluded, based on 194 observations, that the existence of a panorama leads to an 8% increase in value (Rodriguez and Sirmans 1994). This finding has been frequently cited ever since. The type of panorama had not been specified in early studies; Benson et al were the first to do so in 1998. Benson et al. (1998) analyzed 11 years of data, obtaining variables from an official valuation database. Since this database did not contain any data on the view, they visited the entire sample of 5,000 and personally rated the view of each property, i. e. how full or restricted the panorama is. The time factor was treated as an annual, so-called “dummy” variable in the model. The distance from the waterfront was also taken into account as an additional variable. This study also confirmed that the view is a significantly value-increasing factor as well as the fact that the closer the property is to the waterfront, the higher the value-increasing effect gets. According to their analysis, the value-increasing effect of a view of the ocean is 60%, that of a “nice view” is 30.8%, that of a “good view” is 29.4%, while that of a partial view to the ocean is 8.2%. According to a study carried out in Minnesota (USA) based on nearly 5,000 observations, the value-increasing effect of a waterfront panorama regarding a residential property is 10% (Sander and Polasky 2009).

Market players with different cultural backgrounds provide differing estimates in various geographical environments. In Hong Kong, where high-rise buildings are typical, a panorama of the ocean (based on 1,474 observations) only increased the value by 2.97%, based on the hedonic method; moreover, a view of mountains even had a 6.7% value-reducing effect (Jim and Chen 2009). A study carried out in South Africa (230 observations) concluded that the value-increasing effect is 18% (Potgieter and Cloete 2010). However, in Geneva, Switzerland, a panorama of Lake Geneva can be as high as 57% (Baranzini and Schaerer 2011); interestingly, if this view also includes the famous fountain, the Jet d’Eau, the value further increases by 3.6%. Fleischer studied hotels in the Mediterranean, as well as their pricing, in 2011 (Fleischer, 2012). Based on the hedonic analysis of the prices of 2,819 hotel rooms, the author found that a view of the sea leads to a 10% increase in the room price, regardless of seasons and regions. However, a partial view of the sea (e. g. if the panorama can only be seen from a part of the balcony) does not change the room’s price. Staying within the region, according to a study carried out using the CV method, the view of the Acropolis in Athens has a value-increasing effect of 56% (Damigos and Anyfantis 2011).

Authors have tried to differentiate types of panoramas in various manners. Previous studies categorized different panoramas based on their degrees or the extent of the obstruction and represented them in the model with a “dummy” variable (Bourassa et al. 2004; Chau et al. 2002; Brown and Pollakowski 1977; Rodriguez and Sirmans 1994; Benson et al. 1998; Sander and Polasky 2009; Jim and Chen 2009).

Another solution is to segment the view and describe it based on its composition (Li and Will 2005). In the most recent literature, authors focus on determining and analyzing the field of view. Certain authors consider the view angle as a hedonic variable. Fung and Lee (2012) created a simplified model. The authors introduced the Shadow Mask Values (SMK). This, parallel to the view, measures the view of the open sky. In their studies, they show that three view angles (40°, 90° and 140°) give a good approximation to the full value-changing effect of the shadow mask. According to an article by Mothorpe and Wyman (2017), in the event of non-waterfront parcels, a 1% increase in the field of view results in a 0.42% value increase, while in the event of directly waterfront land, this value is 3.85%. With the methodology of computer-assisted aerial mapping, Light Detection and Ranging (LIDAR), the automatic examination of the field of view is more and more frequent. As part of this, the size of the visible water surface (Sander and Polasky 2009; Baranzini and Schaerer 2011;

Hamilton and Morgan 2010; Yamagata et al. 2016) and green surface (Yamagata et al., 2016; Yu et al. 2016) as well as the view of open space (Yamagata et al. 2016) is rated with the use of automatically interconnected regional Geographic Information System (GIS) and aerial (LIDAR) databases.

As we can see, in the research of the panorama's value-increasing effect, the application of methods for analyzing stigmatized property, particularly the hedonic method, is dominant (Bourassa et al. 2004). The application of the "spatial Durbin" model, which filters out spatial interaction and is used in the most recent studies, can be considered an improvement of the hedonic model (Hui et al. 2012; Fan et al. 2016). However, analysts also use methods related to the CV methodology, which is based on fuzzy logic (Li and Will 2005) or the Delphi model (Damigos and Anyfantis 2011).

In Central Europe, the number of scientific studies carried out with regard to stigmatized real estate is negligible. Some research has already been carried out using the hedonic model on detecting the stigmatizing effect of the Budapest Ferenc Liszt International Airport (Hajnal 2017b) and the differences in the values of historical buildings (Kutasi 2016). According to the literature explored by the author, no research has been carried out in this region regarding the value-changing effect of the panorama yet.

3 Methodology

In a data-poor environment, the evaluation of stigmatized properties can be carried out with the CV method (Horváth and Hajnal 2014). For the purpose of this study, the Delphi methodology has been selected within the CV method. The Delphi methodology is based on expert opinions that are brought closer together in the course of a joint learning process in order to provide more and more efficient and precise answers (Malyusz and Pem 2014; Hsu and Sandford 2007).

This study followed the standard Delphi method. The panellists were previously informed on the work programme, which started with an initial opinion survey. The first round of opinions was not presented, instead, the experts listened to lectures on the methods for evaluating the effect of view restriction as well as the international literature on the value-changing effect of a panorama. After the lectures, the second query took place, after which the members of the panel learned about the anonymized, aggregated results of the first and second queries. Their interpretation was followed by the third query, then the joint acknowledgement and acceptance of its results.

The query, in addition to the registration of personal data, consisted of two main parts in all three rounds: first, the participants had to rate different panoramas, then estimate the value-decreasing effect of an establishment that partially or fully obstructs the panorama.

The views intended to represent the real estate market environment in Budapest were the following:

- Full view of Budapest with a panorama of the city and the Danube (image A);
- A rural panorama of hills (image B);
- A view of houses and roofs typical to densely built-up areas in Budapest (image C);
- A view of blocks of flats, which defines a significant proportion of the built environment in Budapest (image D) and
- The direct view of an ongoing construction.

In each case, the question asked concerned the view from the living room of a flat with a floor space of 100 m^2, situated in one of the mountainous areas of Budapest. Figure 1 shows the studied panoramas that have been presented.

In the event of the first question, the experts' task was to determine a favourability index for each view on a scale of 1–100, where 100 represents the maximum favourability index and 1 represents the minimum favourability index.

Fig. 1: (a) Full Budapest panorama. (b) Hilly landscape. (c) Roof view. (d) Block buildings.

Of the views, the fifth one, which directly showed a construction, was rejected by most panellists, valuating it to be really unfavourable, as an average of 21 on the scale of 1–100. For this reason, this view was excluded from the rest of the study.

The second group of questions presented three situations of view restriction for each of the four views:

– Partial view restriction due to the installation of a mobile phone tower;
– Full view restriction due to the installation of a mobile phone tower and
– Partial view restriction due to a construction in front of the building (ongoing construction).

Figure 2 presents the reviewed situations regarding case (a), the full view of Budapest. The same images were shown regarding all four views.

The task of the experts in the case of the second group of questions was to determine the value of the fictional property with regard to the unobstructed (full) panorama for each situation of view restriction. In other words, if the value of the property is 100 units with a full panorama, the panellists had to determine how many units the value of the property would lose in the event of the view restriction.

After the third query, the participants did not wish to modify their opinions anymore. Therefore, the unanimous expert consensus required by the Delphi methodology had been established.

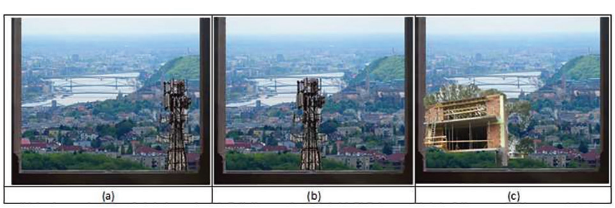

Fig. 2: (a) Partial view restriction. (b) Full view restriction. (c) Partial restriction with ongoing construction.

4 Empirical results

Two expert panels were organized. The first expert panel consisted of 20 senior valuers, who are all well informed regarding the real estate market in Budapest. The panel established its expert opinion as part of the Valuation Knowledge Management Programme of Grant Thornton, an international consulting company, during an all-day event on 31 January 2018. The panel consisted of 13 male and 7 female experts. The panel members' average age was 51 years, and their average experience as valuation experts was 18 years. All panellists had personal experience in the issue of view restriction; those present have previously provided independent expert opinions in 46 such cases altogether.

The second panel was organized by Hungarian Association of Realtors (MAISZ - Magyar Ingatlanszövetség) at 18 May 2018. The all-day event had a similar structure, as the first one – the only difference was that instead the presentation of the second query results, the first panel results was introduced, so only two-query round was elaborated. This second panel consisted of 48 senior valuers, 32 male and 16 female experts. The second panel members' average age was 52.2 years, and their average experience as valuation experts was 16.9 years.

The results of the answers to the first question regarding the favourability index are specified in Tables 1a and 1b.

Figure 3 shows well that in the event of each examined view, the favourability index increased in each round. In the event of the first three views, the decrease in the answers' standard deviation confirms the establishment of an expert consensus. However, the favourability indices of blocks of flats and constructions show a higher and higher standard deviation: the experts participating in the panel had larger and larger differences of opinion regarding these views.

The statistical features of the answers to the second group of questions are specified in Tables 2a and 2b.

Tab. 1a: Statistical indicators of the favourability indices: first panel.

	First round			Second round			Third round		
	Average	Median	Standard deviation	Average	Median	Standard deviation	Average	Median	Standard deviation
Full Budapest	80.25	80	13.98	89.75	90	11.36	92.25	97.5	10.45
Hilly view	71.25	70	14.73	84.75	80	11.25	86.00	85	11.42
Roof view	42.75	40	24.20	58.25	60	14.26	67.75	70	12.19
Block buildings	26.80	22.5	16.31	44.55	50	19.87	52.30	50	22.68
Construction	4.55	1	8.68	9.55	1	12.27	21.85	15	23.52

Tab. 1b: Statistical indicators of the favourability indices: second panel.

	First round			Second round		
	Average	**Median**	**Standard deviation**	**Average**	**Median**	**Standard deviation**
Full Budapest	88.19	90	12.83	90.45	90	8.56
Hilly view	81.35	83	16.10	84.00	83	13.21
Roof view	49.38	50	19.94	64.75	70	16.79
Block buildings	34.17	33	15.24	47.88	50	17.20
Construction	13.67	10	15.44	26.65	20	19.66

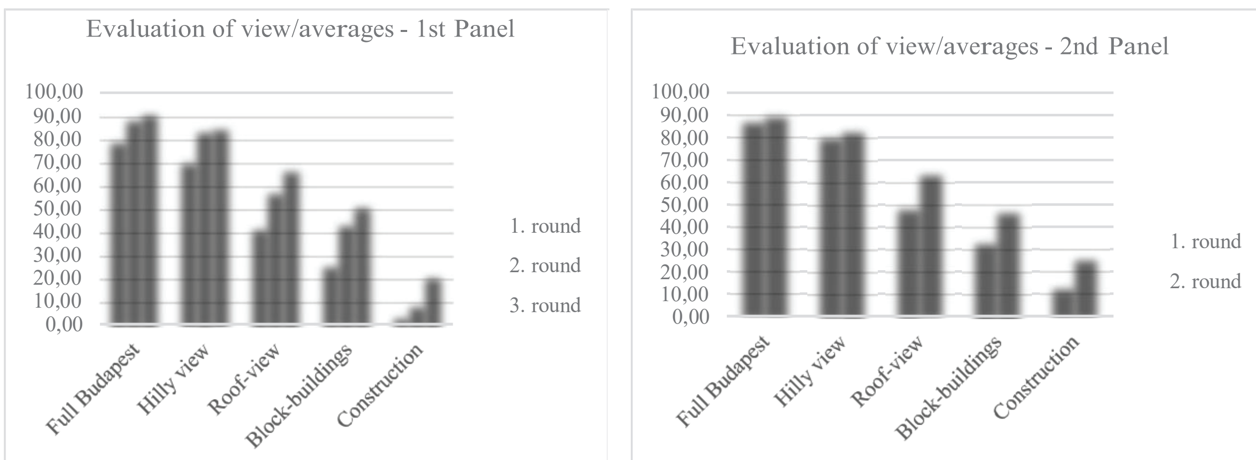

Fig. 3: Averages of the favourability indices (first and second panels).

Tab. 2a: Statistical indices of the valuations: first panel.

	First round			Second round			Third round		
	Average	**Median**	**Standard deviation**	**Average**	**Median**	**Standard deviation**	**Average**	**Median**	**Standard deviation**
Full Budapest									
Partial	76.00	80	21.69	77.95	80	13.50	87.70	*90*	7.38
Partial With Construction View	64.75	70	20.24	66.90	65	18.54	81.75	85	9.22
Full	54.80	62.5	24.44	58.00	60	22.62	76.15	80	10.16
Hilly view									
Partial	73.00	75	17.28	76.35	80	18.17	87.05	87.5	6.43
Partial With Construction View	58.25	60	25.23	62.75	70	24.40	81.75	82.5	7.12
Full	50.80	50	26.55	54.75	55	25.14	76.40	75	9.91
Roof view									
Partial	79.00	*90*	22.42	72.95	80	26.21	89.05	*95*	10.39
Partial With Construction View	72.90	87.5	26.68	68.85	80	29.89	85.60	*90*	12.70
Full	65.25	77.5	26.64	61.70	65	27.78	82.90	*90*	11.53
Block buildings									
Partial	76.25	87.5	26.24	67.70	80	32.13	87.10	95	16.10
Partial With Construction View	70.40	82.5	30.55	65.45	80	34.56	84.95	92	19.01
Full	61.00	77.5	29.50	56.70	70	32.99	81.10	*90*	17.48

Tab. 2b: Statistical indices of the valuations: second panel.

	First round			Second round		
	Average	Median	Standard deviation	Average	Median	Standard deviation
Full Budapest						
Partial	78.40	80	12.94	82.38	80	7.34
Partial With Construction View	69.79	70	15.23	68.75	70	11.25
Full	61.15	63	16.45	68.13	70	11.80
Hilly view						
Partial	71.94	73	17.49	75.75	75	9.64
Partial With Construction View	62.50	65	18.10	65.13	68	11.35
Full	54.79	53	21.51	61.93	60	12.87
Roof view						
Partial	70.77	83	28.55	81.00	85	16.02
Partial With Construction View	68.33	78	27.28	76.00	80	13.45
Full	63.54	73	27.52	73.88	70	11.06
Block buildings						
Partial	65.17	80	30.36	80.10	80	13.16
Partial With Construction View	63.08	75	30.08	77.00	80	14.54
Full	58.13	70	30.10	73.13	73	13.99

In the tables, the standard deviation data related to the answers clearly show that the members of the panel converged towards an expert consensus in each case. In the event of all views, as the examination progressed, panellists gave higher and higher values, i. e. the initial extreme opinions softened in the course of the collaboration.

Regarding the two panels, the second panel's results are significantly higher than the opinions of the first panel. We examined the correlations between the extent of expert experience and the solidity of their opinions in order to support the results of our research. Based on the number of years in operation and expert opinions established (the latter weighted by 0.2), we assigned an experience indicator to each expert and compared them to the solidity of their answers to individual questions. The regressive relationship set up this way showed a weak correlation ($R = 0.590$; $R2 = 0.348$).

As there is no significant difference between the two panel circumstances, members and timing, the two panel result was compounded for the further analysis.

5 Discussion and conclusion

Of the results obtained in the study, the findings of the final rounds made by consensus should be further analyzed. The fictional values provided by the experts can be translated to a decrease in the value of individual view restriction cases defined as a percentage; these values are shown in Figure 4.

Our initial expectation that a view with a lower favourability index would entail a smaller decrease in value only proved to be partially true based on the answers.

The value-reducing effect of the partial view restriction caused by the mobile phone tower is between 14.96% and 18.6%; this technically unanimous opinion is independent of the favourability index of the view that the owner of the property loses. In the event of views with high favourability indices, marked with A and B, the effect of full view restriction was estimated by experts to be higher (plus 12.9% and plus 12.24%), while in the cases of views with lower favourability indices, marked C and D, the difference is smaller (6.64% and 6.49%). Therefore, in this latter event, the fact of the obstruction weighs the same as in the event of views with high favourability indices, while the manner of obstruction (how much the view is impaired) has a smaller significance. Regarding the view angle, however, the previously cited assumption of the literature (Fung and Lee 2012; Mothorpe and Wyman 2017), that the value-reducing effect of view restriction would be proportionate to the view angle of the obstructed view, was not confirmed: in all three cases examined, the angle of view is practically the same (from the right side, the centre and the left side); however, the decreases in value differ significantly.

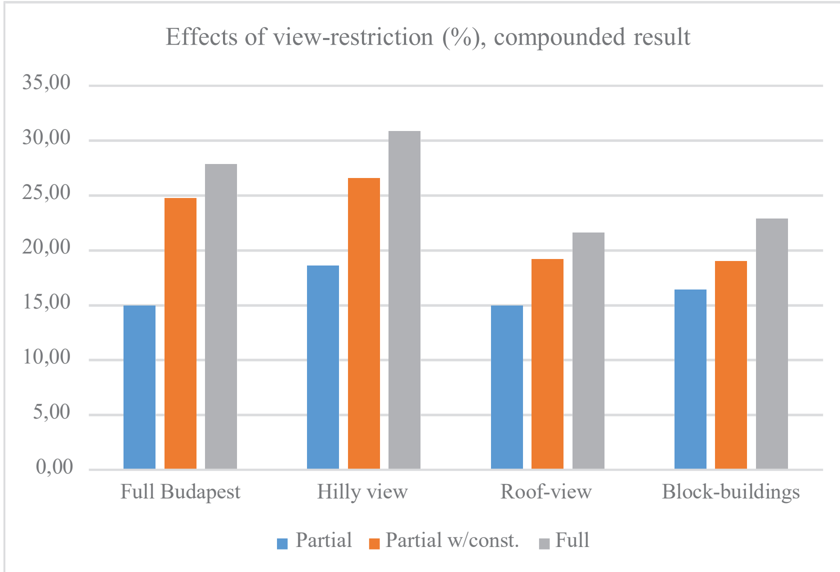

Fig. 4: Averages of the decreases in value.

The presumed significant value-reducing effect of ongoing construction is expected to decline over time (Mundy 1992), particularly when the building is finished and the negative effects of the stigma's first appearance are not attached to the construction anymore. We may assume that in this case the value reduction caused by the view restriction of the building will not be greater than the partial decrease in value caused by the mobile tower, i. e. the same decrease in value can be expected from both the first and the second examined cases.

The hypothesis outlined in the introduction, according to which the extent of the decrease in value that results from view restriction regarding residential properties situated in Budapest follows the trends described in the literature that determine the value of panorama, was confirmed. In the event of views in Budapest, the largest decrease in value is 30.84%, the second largest is 27.86%, which is related to the restriction of the panorama rated to be the most beautiful (full view of Budapest). This value corresponds to the international literature cited, until the 15–19% value of the partial view restriction is slightly higher. However, the study results presumably include an additional element of stigma as well, since the negative social and community sentiments related to view restriction are larger than the added value of the existing panorama. Therefore, the existence of a panorama may be assumed to have a lower value-increasing effect than the percentage determined by the expert panel in relation to Budapest.

The study is doubly limited due to its location. First of all, since the extent of the decrease in value caused by the view restriction, according to the conclusions in the literature, is geographically bound, the results can primarily be used in Budapest. Second, since there are no databases available that could be suitable to apply the RPMs, particularly the hedonic procedure, the back testing of expert opinions with factual data is not yet possible. However, these research findings and the value reduction values obtained may be useful for the preparation of real property development, the planning of building orientation with regard to the view as well as the settlement of disputes regarding view restriction. The Delphi method described here can also be easily implemented in other Central European locations, thereby also creating the possibility of comparing the value-changing effects of views regarding different locations.

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